the case of the Rensch Gneiss. The evidence one way or the other will, however, be greatly extended as the mapping with concomitant chemical investigation progresses, and the Director of the survey, Professor Rosenbusch, evidently desires to await this further evidence before making any decided statements concerning the genetic relationships of the complex. If the Rensch gneisses prove to be altered sedimentary rocks their high content of feldspar and the presence in them everywhere of lenticular masses and strings of quartz and feldspar will certainly be cited by the French authorities as evidences of "granitization." But two questions remain to be decided — first, whether the high content in feldspar is not due to a high content of alkalis in the original sedimentary rocks, these having been perhaps of the nature of feldspathic sandstones, arkoses and greywackes, and secondly, whether the strings and lenses of quartz or quartz and feldspar do not fill spaces opened by the dynamic movements to which the rocks have been subjected, quite independent of any granitic intrusion. Whether in fact any mysterious cementation-like transfusion of granitic material through these rocks has really taken place. The detailed chemical work which is now being carried out will, when completed, undoubtedly decide whether the supposed altered sediments have or have not a composition which can be attributed to a sedimentary series.

A similar twofold origin is claimed by Klemm for the crystalline Grundebirge of the Spessart, although here the sedimentary portion is believed to be of late Palæozoic age and is possibly equivalent to a series of schistose hornstones, graphite schists and garnet rocks, quite distinct from the gneissic series of the Black Forest, which were found by Andreæ and Osann in the Odenwald to the north of Heidelberg.

These studies bearing upon the vexed question of the origin of the crystalline schists have at present an especial interest for petrographers in America, where such enormous areas of these rocks are now under investigation. FRANK D. ADAMS.

Glaciers of North America, a Reading Lesson for Students in Geography and Geology. By ISRAEL C. RUSSELL. Boston: Ginn & Co., 1897.

The preparation of a work of this high grade by a busy university professor of large professional experience and demonstrated investigative ability, as a reading lesson for students of geography and

geology, is worthy of special note as one of the signs of the educational times. It is significant both as an indication of a demand and as exemplifying a supply. It is a gratifying mark of progress that there should have grown to be a place for a work of this character as a supplement to the usual treatises on geography and geology. It is a not less gratifying mark of progress that such a demand should be appreciated and met by a careful and competent scientist of high position.

The work opens with a clear and brief statement of the nature of glaciers, and of their varieties and of the work done by them. Their distribution in North America is then sketched comprehensively, after which individual glaciers and glacial districts are described in detail. It is in the study of these glaciers individually, aided by the numerous photographic illustrations, that the real characters of glaciers will come to be realized by the students. The average reader will doubtless be surprised at the number, variety and instructiveness of American glaciers. They very greatly surpass those of all other accessible continents.

Following the individual descriptions are chapters on the climatic changes indicated by the glaciers of North America, upon the cause and mode of glacial motion, and upon the life history of a glacier. The discussions of theoretical questions are conservative and judicial in tone, and manifest a notable tendency to eclectic conclusions. Professor Russell's comprehensive statement of the various hypotheses of glacial motion will doubtless be found one of the most interesting sections of the volume by advanced glacial students. The work is heartily commended to teachers and general readers as well as students.

T. C. C.

Former Extension of Cornell Glacier near the Southern end of Melville Bay. By RALPH S. TARR. Bull. Geol. Soc. Amer., Vol VIII, pp. 251–268. Plates XXV to XXIX, March 1897.

An abstract of this paper was given in the January-February number of this JOURNAL, pp. 95–96. An editorial relative to it appeared in the same number, pp. 81–85. Communications in reference to it have also appeared in *Science*, Vol. V, No. 113, February 26, p. 344; No. 114, March 5, pp. 400–401, and No. 117, March 26, pp. 515–516. This further notice is introduced mainly for the purpose of presenting